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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/673,744	09/29/2003	Martin Tross	IL920030033US1	1477

7590 11/23/2005  
Stephen C. Kaufman  
Intellectual Property Law Dept.  
IBM Corporation  
P.O. Box 218  
Yorktown Heights, NY 10598

EXAMINER

KO; DANIEL BOKMIN

ART UNIT PAPER NUMBER

2189

DATE MAILED: 11/23/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/673,744	<b>Applicant(s)</b> TROSS ET AL.	
	<b>Examiner</b> Daniel B. Ko	<b>Art Unit</b> 2189	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 29 September 2003.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-60 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-60 is/are rejected.
- 7) ☒ Claim(s) 21 and 41 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>02/16/2005</u> . | 6) <input type="checkbox"/> Other: _____  |

### **DETAILED ACTION**

This action is responsive to the application filed on 09/29/2003. Claims 1-60 have been submitted for examination.

#### ***Claim Objections***

Claims 21 and 41 are objected to because of the following informalities: duplicate clauses. Claim 21 (page 31, line 27) contains 'transfer the data from the first volatile cache memory to the first non-volatile storage media' and this clause is repeated within claim 21 (page 32, lines 5-6).

Claim 41 is objected as same reasoning as above.

Appropriate correction is required.

#### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

1. Claims 1-5, 21-25, and 41-45 are rejected under 35 U.S.C. 102(e) as being anticipated by McCann et al. (U.S. Patent Application Publication, US 2003/0061240 A1), hereinafter simply McCann.

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Regarding claims 1, 21, and 41, McCann teaches following:

receiving the data at the primary storage subsystem from a host processor (paragraphs 23-26, 33, operations of receiving data from a client on network);

writing the data to the first volatile cache memory in the primary storage subsystem (Fig. 2, Unwritten data cache 130a; page 4, paragraph 34);

copying the data from the primary storage subsystem to the secondary storage subsystem (paragraphs 14, 37);

writing the copied data to the second volatile cache memory in the secondary storage subsystem (paragraphs 14, 37);

returning an acknowledgment from the secondary storage subsystem to the primary storage subsystem responsively to writing the copied data to the second volatile cache memory and prior to saving the data in the second non-volatile storage media (Fig. 2, RD 150a, FF 140b; page 4, paragraph 37; RD driver 150a and FF 140b communicates a signal for successful writing);

signaling the host processor that the data have been stored in the data storage system responsively to the acknowledgment from the secondary storage subsystem (paragraphs 11, 37; Sending a signal back to source of the file system when it is determined that the file systems write data operation is stored in the first and second temporary data stores ); and

transferring the data in the primary and secondary storage subsystems from the first and second volatile cache memories to the first and second non-volatile storage media, respectively (paragraphs 15, 46).

Regarding claims 2, 22, and 42, McCann's device transmits data on communication link between the sites (Fig. 2, elements 106a and 106b).

Regarding claims 3, 23, 43, McCann's external storage medium 104 can be interconnected using a small computer systems interface (SCSI) techniques or via a fiber optic cable or other high speed type of interconnection (paragraph 25).

Regarding claims 4-5, 24-25, 44-45, McCann teaches a mirror systems (paragraph 11) and upon occurrence of a failure in the primary storage subsystem, configuring the secondary storage subsystem to serve as the primary storage subsystem so as to receive further data from the host processor to be stored by the data storage system (paragraphs 50, 51).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.

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2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

2. Claims 6-20, 26-40, and 46-60 are rejected under 35 U.S.C. 103(a) as being unpatentable over McCann in view of Yanai et al. (US Patent 6,173,377 B1), hereinafter simply Yanai.

Regarding claims 6, 26, and 46, 'transferring the data from the second volatile cache memory to the second non-volatile storage media comprises processing the data on a fee-per-service basis' is obvious feature because there are many commercial backup services that provide disk spaces for fee.

Regarding claims 7, 14, 27, 34, 47, and 54, McCann does not describe in details about creating record and updating record for transfer data.

Yanai teaches a method comprises creating a record on the primary storage subsystem of the addresses of the data copied to the secondary storage subsystem, and updating the record in response to the message (column 5, lines 13-16; column 24, lines 3-8; column 39, lines 52-65). It is obvious that this record can be created either on primary storage subsystem or secondary storage subsystem based on implementer's risk assessment.

At the time of invention it would have been obvious to a person of ordinary skill in the art to combine the McCann with Yanai. The motivation for doing so would have

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been a recovery of data when there is disk failure (See abstract of Yanai). Yanai states that data can be recover using a secondary log file (See abstract). Therefore, it would have been obvious to implement the McCann's device with Yanai's record for effective recovery when there is problem with mirror systems.

Regarding claims 8, 15, 28, 35, 48, and 55, Yanai teaches a method comprising, upon recovery of the system from a failure of the secondary storage subsystem, conveying, responsively to the record, a portion of the data from the primary storage subsystem to be stored on the secondary storage subsystem (column 35, lines 3-60).

Regarding claims 9, 16, 29, 36, 49, and 56, Yanai teaches a method, wherein updating the record comprises removing from the record the addresses of the data that have been transferred to the second non-volatile storage media (column 35, lines 25-34).

Regarding claims 10, 17, 30, 37, 50, and 57, Yanai teaches a method, wherein creating the record comprises marking respective bits in a bitmap corresponding to addresses of the data copied to the secondary storage subsystem, and wherein updating the record comprises clearing the respective bits (column 35, lines 3-34).

Regarding claims 11, 18, 31, 38, 51, and 58, Yanai teaches a method, wherein transferring the data comprises transferring the data in a range of the addresses from

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the second volatile cache memory to the second non-volatile storage media, and wherein sending the message comprises informing the primary storage subsystem that the data in the range have been transferred, so that the primary storage subsystem updates the record with respect to the range (column 35, lines 12-24, column 38, lines 60-67, column 39, lines 1-15).

Regarding claims 12, 19, 32, 39, 52, and 59, Yanai teaches a method, wherein transferring the data in the range comprises destaging the range of the addresses (column 18, lines 34-41).

Regarding claims 13, 20, 33, 40, 53, and 60, Yanai teaches a method, wherein transferring the data comprises sending a message from the primary storage subsystem to the secondary storage subsystem indicating addresses of the data that have been transferred to the first non-volatile storage media, and wherein the method further comprises creating a record on the secondary storage subsystem of the addresses of the data copied to the secondary storage subsystem, and updating the record in response to the message (column 24, lines 3-14; column 35, lines 3-60).



***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel B. Ko whose telephone number is 571-272-8194.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Manorama Padmanabhan can be reached on 571-272-4210. The fax phone number for the organization where this application or proceeding is assigned is 703-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Daniel B. Ko  
AU 2189



KEVIN VERBRUGGE  
PRIMARY EXAMINER